Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims:

Claim 1 (currently amended). An apparatus for measuring speaker cone displacement relative to a fixed position in an audio speaker having a voice coil aligned with the cone along an axis~~;~~ , the apparatus comprising:

(a) a variable reluctance sensor device; said sensor device including a first unit ~~and a second unit; one unit of said first unit and said second unit being situated in~~ fixed ~~relation~~ relative to said ~~speaker cone~~fixed position~~;~~ and ~~the other unit of said first unit and said~~ a second unit ~~than said one unit being situated~~ mounted for movement with ~~to move in response to motion by~~ said speaker cone at a position on said cone radially offset from said axis;

(b) a signal injecting circuit coupled ~~with said first unit~~ for injecting a predetermined input signal into ~~said~~ one of said first and second units; and

(c) a signal receiving circuit coupled with said one of said first and second units~~;~~ ~~said signal receiving unit~~ for receiving a signal resulting from modulation of said input signal due to variation of reluctance of said sensor device caused by displacement of said first unit relative to ~~from~~ said second unit, and for generating an indicating signal based upon said resulting signal; at least one signal characteristic of said indicating signal being related with said cone displacement.

Claim 2 (currently amended). ~~An~~ The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in~~ of Claim 1, wherein said first unit ~~is~~ comprises one of an electromagnetic coil structure and a core structure; and wherein said second unit comprises the other of said electromagnetic coil structure and said core structure.

Claim 3 (currently amended). ~~An~~ The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in~~ of Claim 1, wherein said second unit is ~~a ferrous core structure~~mounted at a substantially stationary node on said cone.

Claim 4 (currently amended). ~~An~~ The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in Claim 2~~ of Claim 3, wherein said second unit is ~~a ferrous core structure~~mounted on said cone using a wedge.

Claim 5 (currently amended). ~~An~~ The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in~~ of Claim 1, wherein ~~said one unit is said first unit~~ said predetermined input signal is a cyclic wave signal; and said signal receiving circuit comprises a rectifying circuit coupled for rectifying said cyclic wave signal modulated by said variation of reluctance.

Claim 6 (currently amended). ~~An~~ The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in Claim 4~~ of Claim 5, wherein said ~~one unit is said first unit~~ signal receiving circuit further comprises a low pass filter coupled for filtering said rectified signal.

Claim 7 (currently amended). ~~An~~The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in Claim 1~~ of Claim 5, wherein said ~~predetermined input signal is a substantially triangular wave signal~~ first unit comprises one of an electromagnetic coil structure and a core structure; and wherein said second unit comprises the other of said electromagnetic coil structure and said core structure.

Claim 8 (currently amended). ~~An~~The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in Claim 4~~ of Claim 7, wherein said unit comprising said electromagnetic coil structure operates as at least part of a high pass filter having a corner frequency; and said predetermined input signal ~~is a~~ has a frequency ~~is a~~ substantially ~~triangular wave signal~~ below said corner frequency.

Claim 9 (currently amended). ~~An~~ The apparatus ~~for measuring speaker cone displacement in an audio speaker as recited in Claim 6~~ of Claim 7, wherein said predetermined input signal is a substantially triangular wave signal.

Claim 10 (currently amended). An apparatus for measuring speaker cone displacement in an audio speaker~~;~~ , the apparatus comprising:

(a) an electromagnetic coil structure;

(b) a ~~ferrous~~ core structure; said ~~ferrous~~ core structure and said electromagnetic coil structure being mounted with said speaker to effect variable electromagnetic coupling between said ~~ferrous~~ core structure and said electromagnetic coil structure as said speaker cone moves;

(c) a signal injecting circuit coupled with said electromagnetic coil structure for injecting a predetermined cyclic input signal into said electromagnetic coil structure for modulation by said variable magnetic coupling; and

(d) a signal monitoring circuit coupled with said electromagnetic coil structure~~;~~ ~~said signal monitoring circuit~~ for receiving and rectifying ~~an output~~said modulated signal from said electromagnetic coil structure, for generating an indicating signal based upon said output signal; at least one signal characteristic of said indicating signal being related with said cone displacement.

Claim 11 (currently amended). ~~An~~ The apparatus ~~for monitoring speaker cone displacement in an audio speaker as recited in~~ of Claim 10 for measuring said speaker cone displacement relative to a fixed position in an audio speaker having a voice coil aligned with the cone along an axis, wherein one of said electromagnetic coil structure and said core structure is situated in fixed relation to said ~~speaker cone~~ fixed position and the other of said electromagnetic coil structure and said ~~ferrous~~ core structure is ~~situated to move in response to motion by~~mounted for movement with said speaker cone at a position on said cone radially offset from said axis.

Claim 12 (currently amended). ~~An~~ The apparatus ~~for monitoring speaker cone displacement in an audio speaker as recited in Claim 10~~ of Claim 11, wherein said ~~ferrous~~ core structure is situated in ~~fixed relation to~~ said fixed position ~~speaker cone~~ and said electromagnetic coil structure is ~~situated to move in response to motion by said speaker cone~~ mounted at said position offset from said axis.

Claim 13 (currently amended). ~~An~~ The apparatus ~~for monitoring speaker cone displacement in an audio speaker as recited in~~ Claim 10, wherein said ~~predetermined~~ cyclic input signal is a substantially triangular wave signal.

Claim 14 (currently amended). ~~An~~ The apparatus ~~for monitoring speaker cone displacement in an audio speaker as recited in Claim 11~~of Claim 10, wherein said ~~predetermined input signal is a substantially triangular wave signal~~ electromagnetic coil structure operates with a resistive element as a high pass filter having a corner frequency; and said cyclic input signal has a frequency substantially below said corner frequency.

Claim 15 (currently amended). ~~An~~ The apparatus ~~for monitoring speaker cone displacement in an audio speaker as recited in Claim 12~~ of Claim 14, wherein said ~~predetermined input signal is a substantially triangular wave~~ signal monitoring circuit comprises a rectifying circuit coupled for rectifying said modulated signal; and a low pass filter coupled for filtering said rectified signal.

Claim 16 (currently amended). A method for monitoring speaker cone displacement in an audio speaker having a voice coil aligned with the cone along an axis; the apparatus comprising the steps of:

(a) ~~in no particular order:(1)~~ providing an electromagnetic coil structure~~;(2) providing a ferrous~~ mounted offset from said axis for movement relative to a core structure~~;(3) providing a signal injecting circuit coupled with said electromagnetic coil structure; and (4) providing a signal monitoring circuit coupled with said electromagnetic coil structure;~~

(b) ~~mounting said ferrous core structure and said electromagnetic coil structure with said speaker to effect variable electromagnetic coupling between said ferrous core structure and said electromagnetic coil structure as said speaker cone moves;(c) operating said signal injecting circuit to~~ injecting a predetermined cyclic input signal into said electromagnetic coil structure to effect variable magnetic coupling between said electromagnetic coil structure and said core structure as said speaker cone moves, thereby causing modulation of said cyclic input signal; and

~~(d) operating said signal monitoring circuit to receive an output~~ (c) rectifying said modulated input signal ~~from said electromagnetic coil structure and generate~~to provide an indicating signal ~~based on said output signal;~~ , at least one signal characteristic of ~~said indicating signal being~~ which is related with said cone displacement.

Claim 17 (currently amended). ~~A~~ The method ~~for monitoring speaker cone displacement in an audio speaker as recited in~~ of Claim 16, wherein one of said ferrous core structure and said electromagnetic coil structure is situated ~~in fixed relation to said speaker cone and the other of said ferrous core structure and said electromagnetic coil structure is situated to move in response to motion by~~ at a substantially stationary node on said speaker cone.

Claim 18 (currently amended). ~~A~~ The method ~~for monitoring speaker cone displacement in an audio speaker as recited in~~ of Claim 16, wherein said predetermined input signal is a substantially triangular wave signal.

Claim 19 (currently amended). ~~A~~ The method ~~for monitoring speaker cone displacement in an audio speaker as recited in Claim 17 wherein said predetermined input signal is a substantially triangular wave signal~~ of Claim 16, further comprising filtering said rectified signal to provide said indicating signal.